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## Industry Firsts

**Five Innovative Ag Practices  
that are Changing the World**



# Five Innovative Ag Practices that are Changing the World

By Stephanie Metzinger

**A**t a time when the world's population is soaring—to an estimated 9.7 billion in 2020—and natural resources are quickly depleting, farmers are now faced with crushing weather conditions that are affecting their ability to grow food in a sustainable way. In just the past few years, the United States has seen wildfires blanket regions throughout California; unreal temperatures stymie farm production; warm winters threaten the Sierra Nevada snowpack; and devastating storms and floods decimate cities and towns. Some may call this climate change and global warning, while others may say it is “Farm-ageddon.” However this attack on land and resources is labeled, one thing is certain: there is grave concern on how humanity will continue to feed itself.

The United Nations recently released a report that warned how “food security will be increasingly affected by future climate change through yield declines, increased prices, reduced nutrient quality, and supply chain disruptions.” The report, which was developed by more than 100 experts from 52 countries, goes on to detail how we must waste less food and practice better land management in order to maintain food security as the population and negative impacts of climate change increase.

In light of the looming food crisis, farmers have already stepped up to the plate to be part of the solution. Today's farmers are increasingly experimental, and for years, have implemented new practices in their operations that tackle the serious issues that face food systems globally.

Whether it is designing innovative packing solutions to reduce food waste or building machines that reduce greenhouse gas emissions, farmers are leading the way in developing agricultural practices and technologies that are changing the world. In fact, many of Western Growers' 2,400 members have already implemented groundbreaking initiatives on their farms that have allowed them to continue producing a steady supply of food for the state, nation and world.

The following five examples are just a small sample of the cutting-edge advancements that have moved the needle for the ag industry. These are not exclusive and, in fact, represent the tip of

an amazing iceberg that could literally become a list of thousands of innovations.

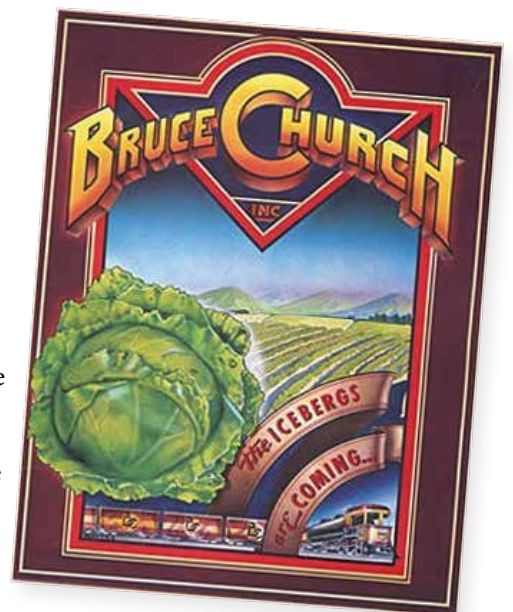
### 1. Introducing Bagged Salads to Extend Shelf-Life

Prior to 1989, consumers did not have the ability to go into the supermarket and buy packaged salads. Instead, any lettuce purchased and not used immediately was thrown out. That's where an agricultural scientist, Jim Lugg, comes in.

In 1963, Lugg was hired as director of research by Bruce Church Inc.—one of the largest U.S. lettuce producers at the time—to look for better ways to preserve crops' freshness during shipment. Lugg turned to Whirlpool for a solution, which eventually resulted in the birth of TransFresh—a partnership between Bruce Church and Whirlpool—in 1966.

The company soon discovered that different gas mixtures of oxygen and CO<sub>2</sub> would extend the shelf life perishables that were being transported in shipping containers and railcars. This discovery led to the novel idea of cutting and washing lettuce, and then packaging it with the same oxygen-and-CO<sub>2</sub> mixture. Lugg then experimented with the bag's film, ensuring that it the permeability of the package let enough oxygen in to keep the lettuce fresh and let enough CO<sub>2</sub> out to keep the flavor of the lettuce.

Nearly 25 years later, TransFresh introduced the first



retail packaged salad available nationwide—the Fresh Express Family Classic Garden Salad Blend. Fresh Express was the very first to successfully package and nationally distribute fresh-cut, ready-to-eat bagged salad. This eventually led to a rollout of salad kits and other blends a few years later. Today, Fresh Express produces nearly 40 million pounds of salad each month.

## 2. Automating Broccoli Harvest to Enhance Farm Production Methods

Agriculture continues to face a labor shortage that has lasted longer than a decade. Over the past few years, the number of farmworkers migrating to the United States from Mexico has dropped,

worsening the shortage. This, paired with an ever-increasing blizzard of regulations, have encouraged farmers and ag-related businesses to adopt mechanization and explore new growing practices to make harvesting crops easier.

Church Brothers Farms has been at the forefront of automation, understanding that the farm must change the way they grow and harvest in order to continue to feed a growing population. More than half a decade ago, Church Brothers partnered with Bayer (legacy Monsanto) to harvest broccoli mechanically. The farm wanted to develop an automated broccoli harvester, but first they needed a plant that would work with the machine.

The new variety of broccoli had to have a head that sat up higher, while growing uniformly and maturing at the same time from plant to plant. The Bayer vegetable breeding team was able to breed a new High-Rise broccoli hybrid, where the crop had a larger, firmer head and cleaner stalk that has less stem trim.

After five years of being fully submerged in the Broccoli Project, Church Brothers unveiled a new automated broccoli harvester in 2018. The harvester cuts the broccoli, which then goes directly into a bin and transported to the processing facility where the florets are washed and bagged.



*Flooding the vineyard at Terranova Ranch*

## 3. Collaborating to Recharge California's Groundwater Supplies

One of the biggest issues facing California is depleted groundwater supplies; this is especially true in the Central Valley where groundwater levels have hit extreme lows. Don Cameron, vice president and general manager of Terranova Ranch in Fresno County, has stepped up to combat this issue head on.

“We take the water that normally flows by our ranch—the flood water that usually causes problems downstream and

eventually ends up in the ocean and is lost to agriculture—and we divert it and bring it on to our farmland,” said Cameron.

Cameron launched a pilot of the groundwater recharge program in 2011, where he opened his irrigation ditches to take excess water from the Kings River to blanket hundreds of acres of vineyards on his farm. He continued to flood his fields for several months, while the grapes lay dormant, in hopes that this effort would recharge the groundwater basin that his farm and surrounding communities

depended on during times of drought.

Working with Sustainable Conservation, an environmental group that works with agriculture to recharge California's groundwater supplies, Cameron was able to prove that the idea worked! Aided by gravity, the water seeped through the soil and filled up the basin, leaving the grapes unharmed. Today, Cameron has replicated this innovative idea across his farm to commodities such as pistachios and alfalfa hay.





*Taylor Farms Gonzales launched the Zero Waste Program in April 2017. Over the lifetime of the program, the facility decreased landfill contribution by 56%, reducing greenhouse gas emissions by 30,923 MTCO2E*

**4. Achieving True Zero Waste Through Emission Reduction**

In June of 2018, Taylor Farms became the industry’s first fresh food company to achieve TRUE (Total Resource Use and Efficiency) Platinum certification for zero waste.

“This is the highest level of zero waste certification available, and we are incredibly proud of the accomplishment,”

said Nicole Flewell, Taylor Farms’ director of sustainability. “Through our efforts we were able to reduce our greenhouse gas emissions by 30,923 metric tons of CO<sub>2</sub>. That’s equivalent to taking 6,510 cars off the road each year.”

Spearheaded by Flewell, the Gonzales Green Team and employees worked together to reduce incoming materials, reuse existing materials when possible

and recycle what remained throughout the facility, completing this initiative in 14 months. A key element of this program focused on working upstream to eliminate wax carton from the supply chain. Led by the raw product procurement team, the group worked with Taylor Farms’ growing partners to move to 100 percent reusable bins and totes, eliminating all single use and wax cartons.



*Taylor Farms Gonzales joined the Taylor Fresh Foods family of operating companies in 2008; today, the 192,000 sq. ft. facility produces 1.4 to 4 million lbs. of fresh produce each week*





*Gills Onions' Advanced Energy Recovery System converts onion waste into electricity*

### 5. Converting Onion Waste into Electricity

Nearly 20 years ago, Gills Onions started to develop the concept of a waste-to-energy system, which would allow the farm to efficiently recycle onion byproduct at its plant in Oxnard rather than

transporting it to a local field.

“As our company grew, the volume of waste coming out of the plant was getting larger and larger to the point where our ranch managers in the fields were getting overburdened,” said Steve Gill, owner of Gills Onions. “I went to

UC Davis and started to work with the ag engineering department up there on how to sustainability utilize this waste.”

Gill and the UC Davis team developed a project that would grind up the waste from the onions, extract the juice, run it through the anaerobic digester, and take the resulting biomethane (renewable natural gas) to put it into hydrogen fuel cells, which is then converted over to the internal combustion engine to generate electricity.

“Environmentally, we’ve reduced about 25,000 tons of CO<sub>2</sub> going into the atmosphere with this process. We generate our own power to reduce power in the plant. We’re at 99.3-percent zero waste at this facility here,” said Gill.

Since becoming operational in 2009, the waste-to-energy system (called Advanced Energy Recovery System) has produced 25 gigawatt hours of electricity, or enough to power 3,740 California homes for a full year. Currently, the AERS is able to generate enough biogas to power a 200 kilowatt generator.



*Steve Gill, owner-partner of Gills Onions, located in Oxnard, Calif.*